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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/885,069	06/21/2001	Yuji Isoda	Q64937	5003

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EXAMINER	
HO, ALLEN C	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 01/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/885,069	ISODA ET AL.	
	Examiner	Art Unit	
	Allen C. Ho	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *60,66,126 and 132-160* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *60,66,126,132-144,149-152 and 157-160* is/are rejected.

7)☒ Claim(s) *145-148 and 153-156* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 60, 66, 157, and 158 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohyama *et al.* (U. S. Patent No. 4,767,927) in view of Struye *et al.* (U. S. Patent No. 6,392,249 B1).

With regard to claims 60 and 66, Ohyama *et al.* disclosed a radiation image read-out method, comprising the steps of: i) linearly irradiating stimulating rays, which have been produced by a line light source (**30**), onto an area of a front surface of a stimulable phosphor sheet (**10**), on which a radiation image has been stored, the stimulating rays causing the stimulable phosphor sheet to emit light in proportion to an amount of energy stored thereon during its exposure to radiation; ii) receiving light, which is emitted from the linear area of the front surface of the stimulable phosphor sheet exposed to the linear stimulating rays with a line sensor (**28**) comprising a plurality of photoelectric conversion devices (2000 pixels per line) arrayed along a length direction of the linear area of the stimulable phosphor sheet, the received light being subjected to photoelectric conversion performed by the line sensor; iii) moving (**12**) the stimulable phosphor sheet with respect to the line light source and the line sensor and in a direction (X) different from a length direction (Y) of the linear area of the stimulable phosphor

sheet; and iv) successively reading (**40**) outputs of the photoelectric conversion devices of the line sensor in accordance with the movement.

However, Ohyama *et al.* taught that the line light source is constituted of a halogen lamp, instead of an organic EL device.

Struye *et al.* taught that an organic EL device could be used as a line light source or a surface light source (column 3, lines 14-17) for stimulating a stimulable phosphor sheet that contains a stored image. When an EL device is used as a surface light source, the line sensor would be replaced by a two-dimensional detector (column 3, lines 63-67). There are many advantages for using an organic EL device. By selecting organic electroluminescent compounds used, the excitation wavelength of an EL device could be tuned to induce maximum emissions from the stimulable phosphor sheet (column 8, lines 18-25), thus eliminating the need for an optical bandpass filter. Moreover, the focusing optics would be eliminated since the EL device could be positioned at close proximity to the stimulable phosphor sheet (Fig. 2).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to replace the halogen lamp and its optics with an organic EL device, since a person would be motivated to make an image read-out apparatus more compact by eliminating complex optics. Furthermore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to replace the line light source with a surface EL device and the line sensor with a two-dimensional detector, since a person would be motivated to reduce the time it takes to scan an image.

With regard to claims 157 and 158, the organic EL device produces stimulating light rays having a line width of approximately 100 μm (column 7, lines 37-8).

3. Claims 133-138 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohyama *et al.* (U. S. Patent No. 4,767,927) and Struye *et al.* (U. S. Patent No. 6,392,249 B1) as applied to claims 60 and 66 above, and further in view of Fukai *et al.* (U. S. Patent No. 4,914,294) and Watanabe *et al.* (U. S. Patent No. 4,831,626).

Ohyama *et al.* in combination with Struye *et al.* disclosed a radiation image read-out method employing an organic EL device as a light source.

However, these references fail to teach that the radiation image read-out method further comprises the step of: monitoring an intensity of the stimulating rays emitted from the organic EL device; and modulating the emission intensity of the organic EL device in accordance with a result of the monitoring step, wherein the modulating step is performed such that the emission intensity of the organic EL device becomes equal to a predetermined value.

Fukai *et al.* disclosed a radiation image read-out apparatus and method comprising a monitoring means (**26**) for monitoring an intensity of the stimulating rays emitted from the light source. The image signal is corrected based on the output of the monitoring means (column 6, lines 37-46).

Watanabe *et al.* disclosed a monitoring means (**6**) and a modulating means (**3**) for modulating the emission intensity of a light source in a feedback loop (Fig. 3).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a monitoring means and a modulating means for modulating the emission intensity of the light source in a feedback loop, since a person would be motivated to maintain the intensity of the light source at a predetermined value in order to produce a consistent image.

4. Claims 149 and 150 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohyama *et al.* (U. S. Patent No. 4,767,927) and Struye *et al.* (U. S. Patent No. 6,392,249 B1) as applied to claims 60 and 66 above, and further in view of Yasuda (U. S. Patent No. 5,602,402).

Ohyama *et al.* in combination with Struye *et al.* disclosed a radiation image read-out method employing a stimulable phosphor sheet.

However, these references fail to teach that the stimulable phosphor sheet is permeable to the emitted light and the emitted light is received from the back surface of the stimulable phosphor sheet.

Yasuda taught collecting image signals from the front and the back surfaces of a permeable stimulable phosphor sheet and combining them to form a superposition image signal having a higher signal-to-noise (S/N) ratio (column 2, lines 47-52).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ a permeable stimulable phosphor sheet and collecting emitted light from the front and the back surfaces of the stimulated phosphor sheet, since a person would be motivated to increase the signal-to-noise (S/N) ratio in the image signal by combining emitted light collected from the front and the back surfaces of the stimulated phosphor sheet.

5. Claims 126, 132, 159, and 160 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohyama *et al.* (U. S. Patent No. 4,767,927) in view of Struye *et al.* (U. S. Patent No. 6,392,249 B1).

With regard to claims 126 and 132, Ohyama *et al.* disclosed a radiation image read-out apparatus, comprising: i) a line light source (**30**) for linearly irradiating stimulating rays onto an area of a front surface of a stimulable phosphor sheet (**10**), on which a radiation image has been

stored, the stimulating rays causing the stimulable phosphor sheet to emit light in proportion to an amount of energy stored thereon during its exposure to radiation; ii) a line sensor (**28**) for receiving light, which is emitted from the linear area of the front surface of the stimulable phosphor sheet exposed to the linear stimulating rays and performing photoelectric conversion of the received light, the line sensor comprising a plurality of photoelectric conversion devices (2000 pixels per line) arrayed along a length direction (Y) of the linear area of the stimulable phosphor sheet; iii) scanning means (**56**) for moving the stimulable phosphor sheet with respect to the line light source and the line sensor and in a direction (X) different from a length direction of the linear area of the stimulated phosphor sheet; and iv) reading means (**40**) for successively reading outputs of the photoelectric conversion devices of the line sensor in accordance with the movement.

However, Ohyama *et al.* taught that the line light source is constituted of a halogen lamp, instead of an organic EL device.

Struye *et al.* taught that an organic EL device could be used as a line light source or a surface light source (column 3, lines 14-17) for stimulating a stimulable phosphor sheet that contains a stored image. When an EL device is used as a surface light source, the line sensor would be replaced by a two-dimensional detector (column 3, lines 63-67). There are many advantages for using an organic EL device. By selecting organic electroluminescent compounds used, the excitation wavelength of an EL device could be tuned to induce maximum emissions from the stimulable phosphor sheet (column 8, lines 18-25), thus eliminating the need for an optical bandpass filter. Moreover, the focusing optics would be eliminated since the EL device could be positioned at close proximity to the stimulable phosphor sheet (Fig. 2).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to replace the halogen lamp and its optics with an organic EL device, since a person would be motivated to make an image read-out apparatus more compact by eliminating complex optics. Furthermore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to replace the line light source with a surface EL device and the line sensor with a two-dimensional detector, since a person would be motivated to reduce the time it takes to scan an image.

With regard to claims 159 and 160, the organic EL device produces stimulating light rays having a line width of approximately 100 μm (column 7, lines 37-8).

6. Claims 139-144 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohyama *et al.* (U. S. Patent No. 4,767,927) and Struye *et al.* (U. S. Patent No. 6,392,249 B1) as applied to claims 126 and 132 above, and further in view of Fukai *et al.* (U. S. Patent No. 4,914,294) and Watanabe *et al.* (U. S. Patent No. 4,831,626).

Ohyama *et al.* in combination with Struye *et al.* disclosed a radiation image read-out apparatus employing an organic EL device as a light source.

However, these references fail to teach that the radiation image read-out apparatus further comprises: a monitoring means for monitoring an intensity of the stimulating rays emitted from the organic EL device; and a modulating means for modulating the emission intensity of the organic EL device in accordance with the monitored intensity, wherein the emission intensity of the organic EL device is modulated to be equal to a predetermined value.

Fukai *et al.* disclosed a radiation image read-out apparatus and method comprising a monitoring means (**26**) for monitoring an intensity of the stimulating rays emitted from the light

source. The image signal is corrected based on the output of the monitoring means (column 6, lines 37-46).

Watanabe *et al.* disclosed a monitoring means (**6**) and a modulating means (**3**) for modulating the emission intensity of a light source in a feedback loop (Fig. 3).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a monitoring means and a modulating means for modulating the emission intensity of the light source in a feedback loop, since a person would be motivated to maintain the intensity of the light source at a predetermined value in order to produce a consistent image.

7. Claims 151 and 152 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohyama *et al.* (U. S. Patent No. 4,767,927) and Struye *et al.* (U. S. Patent No. 6,392,249 B1) as applied to claims 126 and 132 above, and further in view of Yasuda (U. S. Patent No. 5,602,402).

Ohyama *et al.* in combination with Struye *et al.* disclosed a radiation image read-out apparatus employing a stimulable phosphor sheet.

However, these references fail to teach that the stimulable phosphor sheet is permeable to the emitted light and the emitted light is received from the back surface of the stimulable phosphor sheet.

Yasuda taught collecting image signals from the front and the back surfaces of a permeable stimulable phosphor sheet and combining them to form a superposition image signal having a higher signal-to-noise (S/N) ratio (column 2, lines 47-52).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ a permeable stimulable phosphor sheet and collecting emitted light from the front and the back surfaces of the stimulated phosphor sheet, since a person would be motivated to increase the signal-to-noise (S/N) ratio in the image signal by combining emitted light collected from the front and the back surfaces of the stimulated phosphor sheet.

Allowable Subject Matter

8. Claims 145-148 and 153-156 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

With regard to claims 145 and 146, although the prior art discloses radiation image read-out methods, it fails to teach or fairly suggest that these methods further comprise the step of reflecting the stimulating rays toward a surface of the stimulable phosphor sheet with a mirror, and wherein light emitted from the stimulable phosphor sheet is transmitted through the mirror to provide optical path overlap between emitted light and light output from the light source.

With regard to claims 147 and 148, although the prior art discloses radiation image read-out apparatuses, it fails to teach or fairly suggest that theses apparatuses further comprise a mirror disposed to direct light from the line light source to a surface of the stimulable phosphor sheet, the mirror transmitting light emitted from the stimulable phosphor sheet, the mirror causing at least partial optical overlap of the emitted light and light from the light source.

With regard to claims 153 and 154, although the prior art discloses radiation image read-out methods employing an organic EL device, it fails to teach or fairly suggest that the organic EL device comprises a white light emitting device and a red color filter.

With regard to claims 155 and 156, although the prior art discloses radiation image read-out apparatuses employing an organic EL device, it fails to teach or fairly suggest that the organic EL device comprises a white light emitting device and a red color filter.

Response to Arguments

9. Applicant's arguments filed 20 October 2002 have been fully considered but they are not persuasive.

Applicants argue that there is no suggestion or motivation to combine the teachings of Ohyama *et al.* and Struye *et al.* The examiner respectfully disagrees. It was taught by Struye *et al.* that an image stored in a stimulable phosphor sheet could be stimulated by an electroluminescent light source (column 3, lines 9-11). In fact, the electroluminescent light source disclosed by Struye *et al.* is designed to stimulate an image stored in a stimulable phosphor sheet (abstract).

Furthermore, applicants argue that the combination of Ohyama *et al.* and Struye *et al.* with Yasuda would make the apparatus less compact, thus contradicting the motivation for combining the teachings of Ohyama *et al.* and Struye *et al.* The examiner respectfully disagrees. While it is desirable to make an apparatus more compact by reducing the number of optical elements used for directing the stimulating light, it is even more important to increase the signal-to-noise ratio of the image so that a correct diagnosis could be rendered. The examiner does not

see any contradiction in combining these references, since engineering often involves compromises between different goals.

Accordingly, the rejections are being maintained.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1550.

Allen C. Ho
Patent Examiner
Art Unit 2882

ACH ACH 01.20.04

EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER